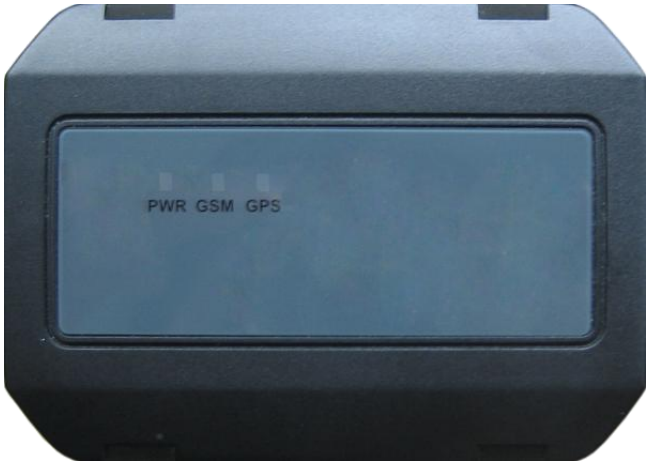
GSM/GPRS/GPS Tracker **GMT100**

@Track Air Interface Protocol

Application Notes: **TRACGMT100AN001**

Revision: 1.0



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0. Revision history

Revision	Date	Author	Description of change
V1.0	2011-09-13	Hendry PAN	Initial

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1. Overview

1.1. Scope of This Document

The @Track Air Interface Protocol is a digital communication interface based on printable ASCII characters over SMS or GPRS which is used for all communication between the backend server and the terminal. The backend server sends a command to the terminal and then the terminal confirms with an acknowledgement message. If necessary, the terminal also sends report messages to the backend server.

The purpose of this document is to describe how to build up the backend server based on the @Track Air Interface Protocol.

1.2. Terms and Abbreviation

Abbreviation	Description
APN	Access Point Network
ASCII	American National Standard Code for Information Interchange
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
HDOP	Horizontal Dilution of Precision
ICCID	Integrated Circuit Card Identity
IP	Internet Protocol
SMS	Short Message Service
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
UTC	Coordinated Universal Time

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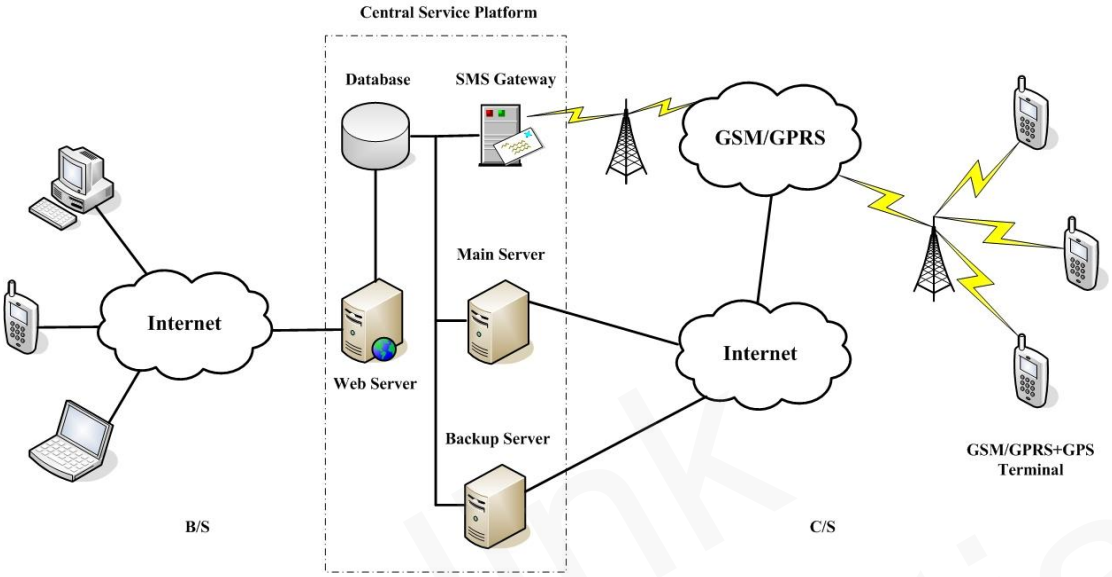
2. System Architecture



The backend server can be accessed by many terminals and should have the following abilities:

- ✧ The backend server should be able to access the internet and listen to the connection originating from the terminal.
- ✧ The backend server should be able to support a TCP or UDP connection with the terminal. It should be able to receive data from the terminal and send data to the terminal.
- ✧ The backend server should be able to receive and send SMS.

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3. Message Description

3.1. Message Format

All of the @Track Air Interface Protocol messages are composed of printable ASCII characters. Each message has the following format:

Message format	Message type
AT+GTXXX=<parameter1>,<parameter2>,…$	Command
+ACK:GTXXX,<parameter1>,<parameter2>,…$	Acknowledgement
+RESP:GTXXX,<parameter1>,<parameter2>,…$	Report

The entire message string ends with character '$'.
The characters 'XXX' identify the deferent message.
The "<parameter1>,<parameter2>,…" carry the message's parameters. The number of parameters is different in different messages. The ASCII character ',' is used to separate the neighbouring parameter characters. The parameter string may contain the ASCII characters: '0'–'9', 'a'–'z', 'A'–'Z'.
Detailed descriptions of each message format are located in the specific message sections.

By sending Commands to the terminal, the backend server can either configure and query the parameters of the terminal or control the terminal to perform specific actions. When the terminal receives Commands over the air, it will reply with a corresponding Acknowledgement message.
According to the configuration of the parameters, the terminal can send Report messages to the backend server. Please see the following figure:

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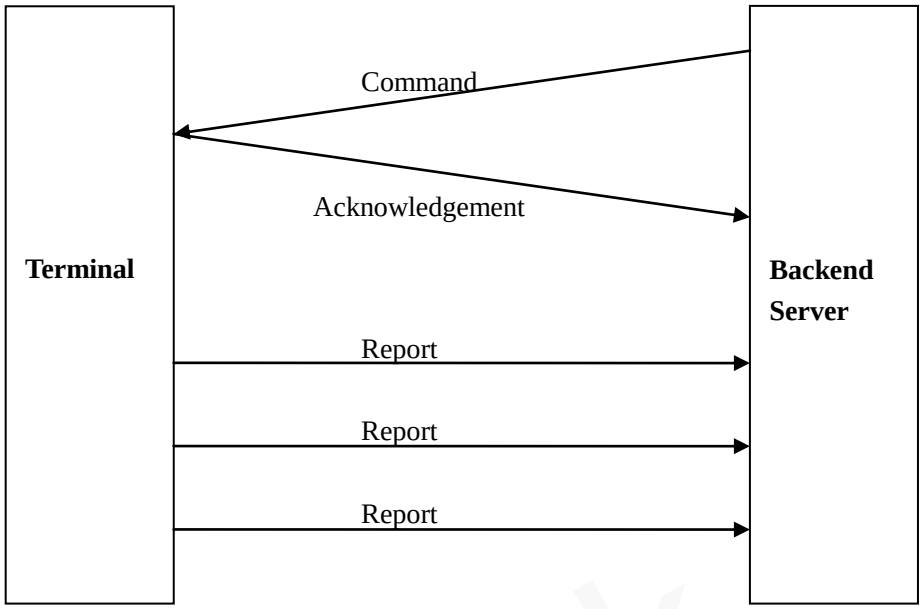

Figure **1**: @Tracker Protocol messages flow

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3.2. Command And Acknowledgement

3.2.1. Bearer Setting Information

The command **AT+GTBSI** is used to configure the GPRS parameters.

➢ **AT+GTBSI=**

Example: **AT+GTBSI=gmt100,cmnet,,,,,,,0000$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Password*>: The valid character of password is ‘0’ ‐ 9’, ‘a’ –‘z’, ‘A’ –‘Z’. The default value is “gmt100”.
✧ <*APN*>: Access point name (APN).
✧ <*APN User Name*>: the GPRS APN user name. If the parameter field is empty, the current value of this parameter will be cleared.
✧ <*APN Password*>: the GPRS APN password. If the parameter field is empty, the current value of this parameter will be cleared.
✧ <*Reserved*>: Not used at present. Please keep empty.
✧ <*Serial Number*>: the serial number for the command. It will be invoked in the ACK message of the command.
✧ <*Tail Character*>: a character to indicate the end of the command. And it must be “$”.

The acknowledgment message of **AT+GTBSI** command:

➢ **+ACK:GTBSI,**

Example: **+ACK:GTBSI,080100,135790246811220,,0000,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Protocol Version*>: The protocol version that the terminal conforms to. The first two characters XX point out the device type. 08 means GMT100. The middle two characters point out the main version number of protocol and the last two characters point out the sub version number of protocol. And both of the main version and the minimum version are hex digital. For example, **020A** means version 2.10.
- <*Unique ID*>: The IMEI of the terminal.
- <*Device Name*>*:* The specified name of the device.
- <*Serial Number*>: A serial number which is equal to the <*Serial Number*> in the corresponding command to distinguish which command the ACK message is for.
- <*Send Time*>: The local time to send the ACK message.
- <*Count Number*>: A self-increasing count number in each acknowledgment message and report message. It begins from 0000 and increases by 1 for each message. And it rolls back after "FFFF".
- <*Tail Character*>: a character to indicate the end of the command. Must be "$".

Note:

Only after both the command **AT+GTBSI** and **AT+GTSRI** are properly set, the ACK messages and other report messages can be sent to the backend server.

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3.2.2. Backend Server Register Information

The command **AT+GTSRI** is used to configure where and how to report all the messages, including the server information and the communication method between the backend server and the terminal. When the terminal is configured correctly, it should be able to report data to the backend server.

➢ **AT+GTSRI=**

Example: **AT+GTSRI=gmt100,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$** **AT+GTSRI=gmt100,3,,1,some.host.name,7011,116.226.45.229,7012,+8613812341234,15,1,,,,,0001$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Report Mode	1	0 – 6	0
Reserved	0		
Buffer Mode	1	0 – 2	1
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	0
SACK Enable	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report Mode*>: This defines the communication method between the backend server and the terminal. Supported report modes as following:

- 0: Stop reporting.
- 1: TCP short-connection preferred mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. And if it fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will try to send data via SMS to the SMS gateway.
- 2: TCP short-connection forced mode. The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. And if it fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the memory buffer if buffer report function is enabled. Otherwise the data is dropped.
- 3: TCP long-connection mode. The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heart beat data. The backend server should respond to the heart beat data from the terminals.
- 4. UDP mode. The terminal will send data to the backend server by UDP protocol. Receiving protocol commands via UDP is supported if the GPRS network allows it. It is recommended to enable heartbeat sending and **+RESP:GTPDP** report when UDP receiving is the case.
- 5: Force on SMS. Only use the SMS for transmitting.
- 6: UDP with fixed local port. Like the UDP mode, the terminal will send data using UDP protocol. The difference is the terminal will use fixed local port rather than random port to communicate with the server in this mode. Thus the backend server could use identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the primary server.

✧ <*Buffer Mode*>: The working mode the buffer report function. When buffer report function is enabled, if the device goes into areas without GSM/GPRS network covering, it will stores all report locally. When the device goes back to areas with GSM/GPRS network covering, it will then send all the buffered reports through GPRS.

- 0: Disable the buffer report function.
- 1: Low priority. Enable the buffer report function. Under this working mode, the device will send the buffered messages after sending the normal messages.
- 2: High priority. Enable the buffer report function. Under this working mode, the device will send all the buffered messages before sending any normal message except for the SOS message (**+RESP:GTSOS**).

✧ <*Main Server IP / Domain Name*>: The IP address or the domain name of the primary server.

✧ <*Main Server Port*>: The port of the primary server.

✧ <*Backup Server IP*>: The IP address of the backup server.

✧ <*Backup Server Port*>: The port of the backup server.

✧ <*SMS Gateway*>: Maximum 20 characters including the optional national code starting with "+" for SMS messages sending. Short code (for example: 10086) is also supported.

✧ <*Heartbeat Interval*>: the interval of sending heartbeat package message (**+ACK:GTHBD**)

when report mode is TCP long-connection mode or UDP mode. If set to 0, no heartbeat package message sending.

✧ <*SACK Enable*>: This defines whether the backend server should respond to the terminal with SACK message when receiving messages from the terminal.

- 0: the backend server does not reply SACK message after receiving message from the terminal.
- 1: the backend server replies SACK message when receiving any message from the terminal.

The acknowledgment message of **AT+GTSRI** command:

➢ **+ACK:GTSRI,**

Example: **+ACK:GTSRI,080100,135790246811220,,0001,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note:

Only after both the command **AT+GTBSI** and **AT+GTSRI** are properly set, the ACK messages and other report messages can be sent to the backend server.

3.2.3. Quick Start Setting

The command **AT+GTQSS** is used to configure the GPRS parameter and backend server information in one command if all these settings are within 160 bytes, otherwise use **AT+GTBSI** and **AT+GTSRI** in two steps.

- **AT+GTQSS=**

Example: **AT+GTQSS=gmt100,cmnet,,,3,,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,0002$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Report Mode	1	0 – 6	0
Reserved	0		
Buffer Mode	1	0 – 2	1
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	0
SACK Enable	1	0|1	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

The acknowledgment message of **AT+GTQSS** command:

- **+ACK:GTQSS,**

Example: **+ACK:GTQSS,080100,135790246811220,,0002,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.4. Global Configuration

The **AT+GTCFG** command is used to configure the global parameters.

- **AT+GTCFG=**

Example: **AT+GTCFG=gmt100,123456,gmt100,,,,,,,,,,,,,,,,0003$** **AT+GTCFG=gmt100,,,1,123.4,0,0,0,1,,2FF,,1,1,300,0,,0,1,,,0003$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
New Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
ODO Enable	1	0|1	0
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	0
GPS On Need	1	0|1	0
GSM report	1	0 – 3	0
Report Composition Mask	<=4	0000 – FFFF	003F
Power Saving Mode	1	0 –2	1
Reserved	0		
Event Mask	<=8	00000000 – FFFFFFFF	1FFFF
Reserved	0		
LED On	1	0|1	0
Info Report Enable	1	0|1	0
Info Report Interval	<=5	30 – 86400sec	300
Location By Call	1	0 – 2	0
Reserved	0		
Power Mode	1	0 – 2	0
Agps Mode	1	0|1	0
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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- <*New Password*>: Set to change the current password.
- <*Device Name*>: An ASCII string to represent the name of the device.
- <*ODO Enable*>: Enable/disable the odograph function to calculate the total mileage. The current mileage is included in every position report message.
- <*ODO Initial Mileage*>: The initial value for calculating the total mileage.
- <*GPS On Need*>: Whether to close GPS chip after retrieving GPS position information.
  - 0: Never close GPS chip
  - 1: Close GPS chip after retrieving GPS information every time.
- <*GSM report*>: If GPS fixing for the report message **+RESP:GTSOS**, **+RESP:GTRTL**, **+RESP:GTLBC**, **+RESP:GTTOW** and **+RESP:GTFRI** were failed and the parameter <G*SM report*> was set to 1, the terminal reports the message **+RESP:GTGSM**, including the information of the service cell and the neighbour cells after those messages if cell's information available. If it was set to 2, the terminal will report the message **+RESP:GTGSM** after getting GPS position successfully every time if cell's information available. If it was set to 3, the terminal will report **+RESP:GTGSM** no matter what result of getting GPS position every time if cell's information available.
  - 0: Not allow the cells' information report.
  - 1: Allow the cells' information report after failed to get GPS position if cell's information available.
  - 2: Report the message **+RESP: GTGSM** after getting GPS position successfully every time if cell's information available.
  - 3: Report the message **+RESP:GTGSM** no matter what result of getting GPS position every time if cell's information available.
- <*Report Composition Mask*>: Bitwise report mask to configure the composition of report message, especially the GPS information composition.
  - Bit 0 for <*Speed*>
  - Bit 1 for < *Azimuth* >
  - Bit 2 for <*Altitude*>
  - Bit 3 for GSM tower data, including <*MCC*>, <*MNC*>, <*LAC*>, <*Cell ID*> and the <*reserved*> parameter "00"
  - Bit 4 for <*Mileage*>
  - Bit 5 for <*Send Time*>
  - Bit 6 for <*Device Name*>

  For each bit, set it to 1 to enable corresponding component in the report, 0 to disable. This mask is effective to all report messages.
- <*Power Saving Mode*>: Set mode of power saving function. If mode of power saving function is set to 1, the fixed report, geo-fence and speed alarm report functions are suspended when the device is at a standstill or the engine is off. If mode of power saving function is set to 2, it is mostly like mode 1 and the difference is that the fixed report will not be suspended and the fix and send interval of it will be set to <*IGF Report Interval*> in **AT+GTFRI** when the engine is off.
  - 0: Disable power saving function
  - 1: Mode 1 of power saving function
  - 2: Mode 2 of power saving function

- <*Event Mask*>: Bitwise mask to configure which event report should be sent to the backend server.
  - Bit 0 for **+RESP:GTPNA**
  - Bit 1 for **+RESP:GTPFA**
  - Bit 2 for **+RESP:GTMPN**
  - Bit 3 for **+RESP:GTMPF**
  - Bit 4 is reserved
  - Bit 5 for **+RESP:GTBPN**
  - Bit 6 for **+RESP:GTBPF**
  - Bit 7 for **+RESP:GTBPL**
  - Bit 8 for **+RESP:GTBTC**
  - Bit 9 for **+RESP:GTSTC**
  - Bit 10 for **+RESP:GTSOA**
  - Bit 11 for **+RESP:GTSTT**
  - Bit 12 for **+RESP:GTANT**
  - Bit 13 for **+RESP:GTPDP**
  - Bit 14 for the power on **+RESP:GTRTL**
  - Bit 15 for the ignition report **+RESP:GTIGN** and **+RESP:GTIGF**
  - Bit 16 for the ignition on location report **+RESP:GTIGL**

  For each bit, set it to 1 to enable corresponding event report, 0 to disable.
- <*LED On*>: Configure the working mode of power LED and GPS LED.
  - 0: Each time the device powers on, both LED's will work for 30 minutes and then are turned off deadly.
  - 1: turn on Power LED and GPS LED if necessary.
- <*Info Report Enable*>: Enable/disable the device information report function (**+RESP:GTINF**). The device information include state of the device, ICCID, GSM signal strength, adapter connection status, backup battery enable setting, battery voltage, charging status, Power and GPS LED working mode, GPS on need setting, external GPS antenna status, the last known time of GPS fix, analog input voltage, all digit inputs and outputs status, time zone information and daylight saving setting..
  - 0: Disable the device information report function.
  - 1: Enable the device information report function.
- <*Info Report Interval*>: The interval of reporting the device information.
- <*Location By Call*>: Configure how to handle the incoming call.
  - 0: Just hang up the call.
  - 1: Hang up the call and report the current position (**+RESP:GTLBC**) to the backend server.
  - 2: Hang up the call and report the current position as a google maps hyperlink to incoming call via SMS.
- <*Power Mode*>: Terminal power supply mode. There are three cases list below:
  - 0: The external power supply will charge the internal backup battery on need and power for unit.
  - 1:The external power supply will only charge the internal backup battery when ignition on is detected. The charge process is stopped when ignition off. During

charging, the external power supply will power the unit, otherwise the internal backup battery will supply power for unit.

- 2: The external power supply will charge the internal backup battery when ignition on is detected or when the internal backup battery capacity is less than 30 percent if ignition is off. During charging, the external power supply will power the unit, otherwise the internal backup battery will supply power for unit.

✧ <*Agps Mode*>: A numeric to indicate whether to enable AGPS. AGPS is helpful to improve the ratio to get GPS position successfully and reduce the time to get GPS position.

- 0: Disable the AGPS function.
- 1: Enable the AGPS function.

The acknowledgment message of **AT+GTCFG** command:

➢ **+ACK:GTCFG,**

Example: **+ACK:GTCFG,080100,135790246811220,,0003,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.5. Digital Output

The **AT+GTOUT** command is used to output specified wave shape from the digital output ports. Total three wave shapes is supported as below. If set to wave shape 1, the device will maintain this wave shape at the specified output port after power reset.

Wave shape 1:

✓ <*Duration*> = 0ms, <*Toggle Times*> = 0

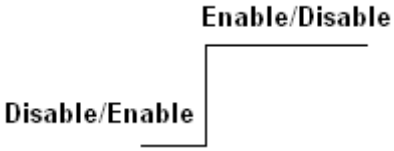

Figure **2**: Wave Shape 1

Wave shape 2:

✓ <*Duration*> = 500ms, <*Toggle Times*> = 1

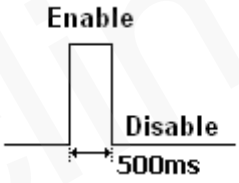

Figure **3**: Wave Shape 2

Wave shape 3:

✓ <*Duration*> = 800ms, <*Toggle Times*> = 3

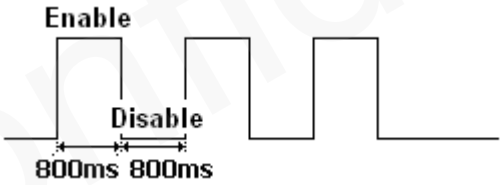

Figure **4**: Wave Shape 3

➢ **AT+GTOUT=**

Example: **AT+GTOUT=gmt100,1,0,0,0,,,,,,,,,0004$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Output1 Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0

Toggle Times	<=3	0 – 255	0
CUT Relay Status	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Output1 Status*>: Used only for the wave shape 1 as shown in **Figure** 2 to set the final status of the output port.
  - 0: Disable status.
  - 1: Enable status.
- ✧ <*Duration*>: Please refer to **Figure** 2, **Figure** 3 and **Figure** 4. Unit is 100ms.
- ✧ <*Toggle Times*>: Please refer to **Figure** 2, **Figure** 3 and **Figure** 4.
- ✧ <*CUT Relay Status*>: Used only for the wave shape 1 as shown in **Figure** 2 to set the final status of the CUT relay output port.
  - 0: Disable status.
  - 1: Enable status.

The acknowledgment message of **AT+GTOUT** command:

- ➢ **+ACK:GTOUT,**

Example: **+ACK:GTOUT,080100,135790246811220,,0004,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.6. Digital Input Port Setting

The command **AT+GTDIS** is used to configure the parameters of 2 digital input ports. Input <*Ignition Detection*> is dedicated for ignition detection. The digital input port 1 is customizable. If the logical status is changed on the digital input port 1, the device will report message **+RESP:GTDIS** to the backend server.

➢ **AT+GTDIS=**

Example: **AT+GTDIS=gmt100,0,2,,,1,1,4,,,,,,0005$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Ignition Detection	1	0	0
Sample Period	<=2	0|1 – 12(×2s)	1
Reserved	0		
Reserved	0		
Input ID 1	1	1	1
Enable	1	0|1	0
Debounce Time	<=2	0 – 20(×10ms)	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Ignition Detection*>: ID of the ignition detection port.

✧ <*Input ID 1*>: the digital input port ID.

✧ <*Sample Period*>: the sampling period of the non-interruptible input port.

✧ <*Enable*>: Enable or disable the interrupt input.

- 0: Disable
- 1: Enable

✧ <*Debounce Time*>: The time for debouncing.

The acknowledgment message of **AT+GTDIS** command:

- **+ACK:GTDIS,**

Example: **+ACK:GTDIS,080100,135790246811220,,0005,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.7. Input/Output Port Binding

This command is used to configure the user defined output-port action triggered by input ports. If the IO combination is set and the corresponding condition appears, the device will output specified wave shape on the specified output port. Otherwise, the device will restore the initial status of the specified output port. And the device will report message **+RESP:GTIOB** to the backend server when the logical status of bound input ports changes.

➢ **AT+GTIOB=**

Example: **AT+GTIOB=gmt100,1,3,3,3,1,0,8,3,,,,,0006$** **AT+GTIOB=gmt100,1,3,3,3,2,1,,,,,,,0006$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
IOB ID	1	0 – 2	
Input Mask	1	0 – 3	0
Trigger Mask	1	0 – 3	0
Input Sample Period	<=2	0|1 – 12(×2s)	0
Output ID	1	0 – 2	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*IOB ID*>: ID of the user defined IO binding.

✧ <*Input Mask*>: Bitwise mask for input ports composition. Each bit, from bit 0 to bit 1, represents one digital input port. Set to 1 to enable and 0 to disable corresponding input port.

- bit0: ignition detection
- bit1: digital input 1

✧ <Trigger Mask>: bitwise mask for trigger condition composition of the corresponding input ports. Each bit, from bit 0 to bit 1, represents the logical status of the corresponding input

port to trigger the IOB event. Set to 1 to use enable status as the trigger condition and 0 to use disable status. Only when the logical status of all the input ports in one IO binding meets the trigger condition is the IOB event triggered.

- bit0: ignition detection
- bit1: digital input 1

✧ <*Input Sample Period*>: The period to check the status of all the digital input ports in one IO binding. **AT+GTIOB** and **AT+GTDIS** use independent sample period to check the input port status even for the same input port.

✧ <*Output ID*>: ID of the output port to output specified wave when the trigger condition meets. 0 means no wave will be output.

Note:

If <*Output ID*> is set to 2 which is used for CUT relay, only <*Output Status*> could be used to define how to output wave shape 1 as shown in **Figure** 2. In this case <*Duration*> and <*Toggle Times*> should be empty. The following settings should keep the same with this note.

The acknowledgment message of **AT+GTIOB** command:

➢ **+ACK:GTIOB,**

Example: **+ACK:GTIOB,060100,135790246811220,,1,0006,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
IOB ID	1	0 – 2	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.8. External Power Supply Monitoring

The command **AT+GTEPS** is used to configure the parameters of external power supply monitoring. The device will measure and monitor the voltage of the external power supply. If the voltage of the external power supply matches the predefined alarm condition, the device will report an alarm message **+RESP:GTEPS** to the backend server to notify the status of the external power supply.

➢ **AT+GTEPS=**

Example: **AT+GTEPS=gmt100,2,250,12000,3,2,1,1,0,0,1,,,,0007$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Mode	1	0 – 2	2
Min Threshold	<=5	250 – 28000 mV	9500
Max Threshold	<=5	250 – 28000 mV	15000
Sample Period	<=2	0|1 – 12(×2s)	1
Debounce Time	1	0 – 5 (×1s)	1
Output ID	1	0 – 2	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Sync with FRI	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: Working mode of the external power supply monitoring.

- 0: Disable the external power supply monitoring.
- 1: Enable the external power supply monitoring. If the current voltage is within the range of (<*Min Threshold*>, <*Max Threshold*>), the **+RESP:GTEPS** alarm will be triggered.
- 2: Enable the external power supply monitoring. If the current voltage is outside the

range of (<*Min Threshold*>, <*Max Threshold*>), the **+RESP:GTEPS** alarm will be triggered.

- ✧ <*Min Threshold*>: The lower limit to the voltage of the external power supply to trigger the alarm.
- ✧ <*Max Threshold*>: The upper limit to the voltage of the external power supply to trigger the alarm.
- ✧ <*Sample Period*>: The sampling period to measure the external power supply.
- ✧ <*Debounce Time*>: The time for debouncing to avoid exceptional voltage drop of the external power supply.
- ✧ <*Output ID*>: ID of the output port to output specified wave shape when the **+RESP:GTEPS** alarm is triggered. If set to 0, no output wave.
- ✧ <*Sync with FRI*>: Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the fixed report message.
  - 0: Do not report external power supply voltage with fixed report message.
  - 1: Report external power supply voltage with fixed report message.

The acknowledgment message of **AT+GTEPS** command:

➢ **+ACK:GTEPS,**

Example: **+ACK:GTEPS,080100,135790246811220,,0007,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.9. Analog Input Port Setting

The command **AT+GTAIS** is used to configure the parameters of analog input port.

➢ **AT+GTAIS=**

Example: **AT+GTAIS=gmt100,1,0,250,15000,2,,1,1,0,0,1,,,,,,0008$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4～6	'0'～'9' 'a'～'z' 'A'～'Z'	gmt100
Analog Input ID1	1	1	1
Mode	1	0|1|2	0
Min Threshold	<=4	250～28000mV	
Max Threshold	<=4	250～28000mV	
Sample Rate	<=2	0|1～12(×2s)	0
Reserved	0,TBD		
Output ID	1	0 – 2	0
Output Active	1	0|1	0
Duration	<=3	0～255(×100ms)	0
Toggle Times	<=3	0～255	0
Sync with FRI	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000～FFFF	
Tail Character	1	$	$

✧ <*Analog Input ID 1*>: The analog input port ID.

✧ <*Mode*>: Working mode of the analog input alarm (**+RESP :GTAIS**).

- 0: Disable analog input alarm.
- 1: Enable analog input alarm. If the current input voltage is within the range of (<*Min Threshold*>, <*Max Threshold*>), the alarm will be triggered.

- 2: Enable analog input alarm. If the current input voltage is outside the range of (<*Min Threshold*>, <*Max Threshold*>), the alarm will be triggered.

✧ <*Min Threshold*>: The lower limit to the voltage of the analog input port to trigger the alarm.

✧ <*Max Threshold*>: The upper limit to the voltage of the analog input port to trigger the alarm.

✧ <*Sample Rate*>: The sampling period of the analog input port.

✧ <*Output ID*>: Specify the ID of the output port to output specified wave shape when the analog input alarm is triggered. If set to 0, no output wave.

✧ <*Output Active*>: set the final status of the output port.

- 0: Disable status.
- 1: Enable status.

✧ <*Toggle Times*>: The times of the square-wave.

✧ <*Sync with FRI*>: The device can send the analog input voltage periodically along with fixed report message. Set this field to 1 to enable it, 0 to disable.

The acknowledgment message of **AT+GTAIS** command:

➢ **+ACK:GTAIS,**

Example: **+ACK:GTMAI,080100,135790246811220,,0008,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.10. Fixed Report Information

The command **AT+GTFRI** is used to configure the parameters of scheduled report (**+RESP:GTFRI**).

➢ **AT+GTFRI=**

Example:
AT+GTFRI=gmt100,0,,,,,,,,,,,,,,,0009$
AT+GTFRI=gmt100,1,1,,1,1000,2300,180,30,,,,,600,,,,,0009$
AT+GTFRI=gmt100,2,1,,1,1000,2300,,,500,,,,,,,,0009$
AT+GTFRI=gmt100,3,1,,1,1000,2300,,,,1000,,,,,,,0009$
AT+GTFRI=gmt100,4,1,,1,1000,2300,,60,,300,,,,,,,0009$

Parameter	Length(byte)	Range/Format	Default
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Mode	1	0 – 4	0
Discard No Fix	2	0|1	1
Reserved	0		
Period Enable	1	0|1	1
Start Time	4	HHMM	0000
End Time	4	HHMM	0000
Check Interval	<=5	30 – 86400sec	180
Send Interval	<=5	5 – 86400sec	30
Distance	<=5	50 – 65535m	1000
Mileage	<=5	50 – 65535m	1000
Reserved	0		
Corner Report	<=3	0 | 40 – 100	0
IGF Report Interval	<=5	300-86400sec	600
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

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- <*Mode*>: The working mode of the fixed report.
  - 0: Disable this function.
  - 1: Fixed Timing Report. The positional report message is sent to the backend server periodically according to the parameter <*Send Interval*>.
  - 2: Fixed Distance Report. The positional report message is sent to the backend server when the straight-line distance between the current GPS position and the last sent GPS position is greater than or equal to the distance specified by parameter <*Distance*>.
  - 3: Fixed Mileage Report. The positional report message is sent to the backend server when the path length between the current GPS position and the last sent GPS position is greater than or equal to the mileage specified by parameter <*Mileage*>. This function need connect the vehicle ignition signal to the specified digital input port of the device.
  - 4: Optimum Report. Simultaneously observe both time interval and path length between two adjacent reports. Report device position if the calculated time interval per current time against the last report time is greater than the <*Send Interval*>, and the length of path between the current position and the last position is greater than the <*Mileage*> setting. This function need connect the vehicle ignition signal to the specified digital input port of the device.
- <*Discard No Fix*>: Disable/enable reporting when there is no GPS fixing
  - 0: Enable reporting
  - 1: Disable reporting
- <*Period Enable*>: Disable/enable the time range specified by <*Start time*> and <*End time*>. If the time range is enabled, the position reporting is limited within the time range.
- <*Start Time*>: The start time of the scheduled fixed report. The valid format is "HHMM". The value range of "HH" is "00"–"23". The value range of "MM" is "00"–"59".
- <*End Time*>: The end time of the scheduled fixed report. The valid format and range are same as <*Start Time*>.
- <*Check Interval*>: The interval time to fix GPS, its value range is 30 – 86400 and the unit is second. The parameter is used only when the parameter <*GPS On Need*> in **AT+GTCFG** is set to 1.

  If <*GPS On Need*> was set as 1, the device has two modes to operate the GPS module according to the value of <*Check Interval*>:
  - "Normal mode": If the <*Check Interval*> is no less than 60 seconds, the terminal will close the GPS chip every time after GPS fixing finishes in order to save power.
  - "Emergency mode": If the <*Check Interval*> is less than 60 seconds, the terminal will never close the GPS chip unless <*Power Saving Enable*> is 1 and the state in +RESP:GTINF is 0x16(Tow) or 0x1A(Fake Tow) or 0x11(Ignition Off Rest) or 0x12(Ignition Off Motion) or 0x41(Sensor Rest). In this mode, the <*Send Interval*> will be ignored, the terminal reports every <*Check Interval*> time, and the <*Check Interval*> will be forced to 30 seconds if it is less than 30 seconds.

  Due to the limitation of the maximum report message length, it must be assured that: <*Send Interval*> / <*Check Interval*> <= 15.
- <*Send Interval*>: Period to send the position information. The value range is 5 – 86400 and

the unit is second. If <*report mode*> in **AT+GTSRI** is set to force on SMS, this should be greater than 15 seconds.

- ✧ <*Distance*>: the specified distance to send the position information when <*Mode*> is 2. Unit: meter.
- ✧ <*Mileage*>: the specified length to send the position information when <*Mode*> is 3 and 4. Unit: meter.
- ✧ <*Corner Report*>: The threshold to determine whether the device is turning around a corner. 0 to disable the corner report. For other values, the device will compare the current heading with the last known corner, if the difference is greater than or equal to this value, send the corner report with **+RESP:GTFRI**.
- ✧ <*IGF Report Interval*>*:* Period to fix and send the position information when <*Power Saving Mode*> in **AT+GTCFG** is set to 2 and the engine is off and if <*Mode*> is set to 1 (Fixed Timing Report). Its value range is 300 – 86400 and the unit is second.

The acknowledgment message of **AT+GTFRI** command:

- ➢ **+ACK:GTFRI,**

Example: **+ACK:GTFRI,080100,135790246811220,,0009,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.11. Geo-Fence Information

The command **AT+GTGEO** is used to configure the parameters of Geo-Fence. (Geo-Fence is a virtual perimeter on a geographic area using a location-based service, so that when the geofencing terminal enters or exits the area a notification is generated. The notification can contain information about the location of the terminal and may be sent to the backend server.)

➢ **AT+GTGEO=**

Example: **AT+GTGEO=gmt100,0,3,121.412248,31.187891,1000,600,1,1,0,0,,,,,000A$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
GEO ID	1	0 – 4	
Mode	1	0 – 3	0
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	50
Check Interval	<=5	0|5 – 86400sec	0
Output ID	1	0 – 2	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*GEO ID*>: ID of the Geo-Fence. Total five zones, 0 to 4, are supported.

✧ <*Mode*>: The working mode of the Geo-Fence to report the message **+RESP:GTGEO** to the backend server.

- 0: disable the zone's Geo-Fence function.
- 1: Entering the zone. The report will be generated only when the terminal enters the Geo-Fence.

- 2: Exiting the zone. The report will be generated only when the terminal exits from the Geo-Fence.
- 3: Both entering and exiting.

✧ <*Longitude*>: The longitude of a point which is defined as the center of the Geo-Fence circular region. The format is "(–)xxx.xxxxxx" and the value range is from "–180.000000" to "180.000000". The unit is degree. West longitude is defined as negative starting with minus " – " and east longitude is defined as positive without "+".

✧ <*Latitude*>: The latitude of a point which is defined as the centre of the Geo-Fence circular region. The format is "(–)xx.xxxxxx" and the value range is from "–90.000000" to "90.000000". The unit is degree. South Latitude is defined as negative starting with minus " – " and north Latitude is defined as positive without "+".

✧ <*Radius*>: The radius of the Geo-Fence circular region. The value range is (50 – 6000000) and the unit is meter.

✧ <*Check Interval*>: The interval of GPS checking for the Geo-Fence alarm.

The acknowledgment message of **AT+GTGEO** command:

➢ **+ACK:GTGEO,**

Example: **+ACK:GTGEO,080100,135790246811220,,0,000A,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
GEO ID	1	0 – 4	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.12. Tow Alarm Configuration

The **AT+GTTOW** command is used to configure the motion sensor and the parameters for tow alarm.

➢ **AT+GTTOW=**

Example: **AT+GTTOW=gmt100,1,5,0,120,1,0,5,10,4,10,4,,,,,,,,,000B$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Tow Enable	1	0|1	0
Engine Off to Tow	<=2	0 – 900 sec	60
Fake Tow Delay	<=2	0 – 600 sec	60
Tow Interval	<=5	0 – 86400 sec	300
Tow Output ID	1	0 – 2	0
Tow Output Status	1	0|1	0
Tow Output Duration	<=3	0 – 255 (×100ms)	0
Tow Output Toggle Times	<=3	0 – 255	0
Rest Duration	<=3	1 – 255 (×15sec)	2
Motion Duration	<=2	1 – 99 (×100ms)	3
Motion Threshold	1	2 – 9	2
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Tow Enable*>: Enable or disable tow alarm (**+RESP:GTTOW**).

- 0: Disable the tow alarm
- 1: Enable the tow alarm

✧ <*Engine Off to Tow*>: A time parameter to judge whether the device is considered being towed after the engine off. If the motion sensor doesn't detect stillness within the specified time after engine off, the device is being towed.

✧ <*Fake Tow Delay*>: After engine off and stillness detected, if the motion sensor detects moving again, the device turns into a state called fake tow. If the device keeps in fake tow after a period of time defined by the parameter <*Fake Tow Delay*>, it is considered being towed.

✧ <*Tow Interval*>: The period to send tow alarm message.

✧ <*Tow Output ID*>: The ID of the output port to output the specified wave shape when tow event is detected.

✧ <*Tow Output Status*>: Please refer to the parameter <*Output1 Status*> in the chapter 3.2.5 when <*Tow Output ID*> is set to 1 and refer to the parameter <*CUT Relay Status*> in the chapter 3.2.5 when <*Tow Output ID*> is set to 2.

✧ <*Tow Output Duration*>: Please refer to the parameter <*Duration*> in the chapter 3.2.5 when <*Tow Output ID*> is set to 1.

✧ <*Tow Output Toggle Times*>: Please refer to the parameter <*Toggle Times*> in the chapter 3.2.5 when <*Tow Output ID*> is set to 1.

✧ <*Rest Duration*>: A time parameter to make sure that the device enters stillness status, i.e. the status of the device will be changed to stillness if the motion sensor detects stillness and maintains for a period of time defined by the parameter <*Rest Duration*>.

✧ <*Motion Duration*>: A time parameter to make sure that the device enters motion status, i.e. the status of the device will be changed to motion if the motion sensor detects motion and maintains for a period of time defined by the parameter <*Motion Duration*>.

✧ <*Motion Threshold*>: The threshold for the motion sensor to measure whether the device is moving.

✧ <*Working Time Enable*>: A time parameter to make sure that the device enters motion status, i.e. the status of the device will be changed to motion if the motion sensor detects motion and maintains for a period of time defined by the parameter <*Motion Duration*>.

✧ <*Motion Threshold*>: The threshold for the motion sensor to measure whether the device is moving.

The acknowledgment message of **AT+GTTOW** command:

➢ **+ACK:GTTOW,**

Example: **+ACK:GTTOW,080100,135790246811220,,000B,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	

Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.13. Speed Alarm

This command is used to set a speed-alarm range for the terminal. According to the working mode, the terminal will report message **+RESP:GTSPD** to the backend server when its moving speed is outside or inside of the range.

- **AT+GTSPD=**

Example: **AT+GTSPD=gmt100,1,80,120,60,300,1,1,0,0,,,,,,,,,,,000C$** **AT+GTSPD=gmt100,2,80,120,60,300,1,1,0,0,,,,,,,,,,,000C$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Mode	1	0 – 3	0
Min Speed	<=3	0 – 400km/h	0
Max Speed	<=3	0 – 400km/h	0
Duration	<=4	15 – 3600sec	60
Send Interval	<=4	30 – 3600sec	300
Output ID	1	0 – 2	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	

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Tail Character	1	$	$

- ✧ <*Mode*>: The working mode of the speed alarm.
  - 0: Disable speed alarm.
  - 1: Report speed alarm if the current speed is within the speed range defined by <*Min Speed*> and <*Max Speed*>.
  - 2: Report speed alarm if the current speed is outside the speed range defined by <*Min Speed*> and <*Max Speed*>.
  - 3: Report speed alarm only one time if the current speed is within or outside the speed range defined by <*Min Speed*> and <*Max Speed*>. In this mode, <*Send Interval*> will be ignored.
- ✧ <*Min Speed*>: The lower limit speed.
- ✧ <*Max Speed*>: The upper limit speed.
- ✧ <*Duration*>: If the speed meets the alarm condition and maintains a period of time defined by <*Duration*>, the speed alarm will be triggered.
- ✧ <*Send Interval*>: The interval time of sending speed alarm message.

The acknowledgment message of **AT+GTSPD** command:

- ➢ **+ACK:GTSPD,**

Example: **+ACK:GTSPD,080100,135790246811220,,000C,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.14. SOS Function

This command is used to configure the specified input port for emergency. When an emergency occurs, the end user can use this input port to trigger reporting current position as a google maps hyperlink to <*SOS Number*> via SMS and report position message **+RESP:GTSOS** to the backend server. A specified wave shape can be configured to output on specified output port.

➢ **AT+GTSOS=**

Example: **AT+GTSOS=gmt100,1,1,+8613812341234,1,1,0,0,,,,,000D$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Mode	1	0 – 2	0
Digital Input ID	1	0|1	0
SOS Number	<=20		
Output ID	1	0 – 2	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: The working mode of SOS function.
- 0: Disable SOS function.
- 1: Send the current position to the backend server only.
- 2: Send the current position as a google maps hyperlink to the <*SOS Number*> via SMS.

✧ <*Digital Input ID*>: ID of the digital input port which triggers the SOS function. 0 means the SOS function is disabled. The corresponding digital input port should be configured by the command **AT+GTDIS** first. If configured to trigger the SOS function, there is no **+RESP:GTDIS** report message for the specified digital input port.

✧ <*SOS number*>: the emergency phone number.

The acknowledgment message of **AT+GTSOS** command:

- **+ACK:GTSOS,**

Example: **+ACK:GTSOS,080100,135790246811220,,000D,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.15. Excessive Idling Detection

The command **AT+GTIDL** is used to detect the engine excessive idling (stationary while ignition on). To use this command, the ignition signal must be connected to the device. When the device detects that the vehicle is entering into the idle status, it will report event message **+RESP:GTIDN** to the backend server. When the vehicle leaves the idle status, the device will report event message **+RESP:GTIDF** to the backend server.

➢ **AT+GTIDL=**

Example: **AT+GTIDL=gmt100,1,2,1,,,,,1,1,0,0,,,,,000E$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Mode	1	0|1	0
Time to Stationary	1	1 – 5 min	2
Time to Movement	1	1 – 5 min	1
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: Working mode.
- 0: Disable this function
- 1: Enable this function.

✧ <*Time to Stationary*>: If the vehicle is detected to be stationary with ignition on for this time

long, it is considered to be in idling status.

✧ <*Time to Movement*>: After the vehicle enters into idling status, if it moves again or turns ignition off and keeps in that status for this time long, the vehicle is considered to leave idling status.

The acknowledgment message of **AT+GTIDL** command:

➢ **+ACK:GTIDL,**

Example: **+ACK:GTIDL,080100,135790246811220,,000E,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.16. Harsh Behavior Monitoring

The command **AT+GTHBM** is used to monitor the harsh behavior of drive with GPS. Two harsh behaviors are monitored, the harsh braking and the harsh acceleration. According the speed read from GPS, 3 levels of speed are defined including high speed, medium speed and low speed. For each speed level, 2 thresholds of speed change are defined to determine the harsh braking and harsh acceleration. If the change of speed within 5 seconds are greater than the corresponding threshold, the device will report **+RESP:GTHBM** message to the backend server to indicate the harsh behavior. The same harsh behavior within 30 seconds only reports once. For this function to work, the <*GPS on Need*> in **AT+GTCFG** must set to 0.

- **AT+GTHBM=**

Example: **AT+GTHBM=gmt100,1,,,100,21,6,,60,21,6,,,21,15,,1,1,8,3,,,,,000F$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Enable	1	0|1	0
Reserved	0		
Reserved	0		
High Speed	<=3	100 – 400km/h	100
ΔVhb	<=3	0 – 100km/h	0
ΔVha	<=3	0 – 100km/h	0
Reserved	0		
Medium Speed	<=3	60 – 100km/h	60
ΔVmb	<=3	0 – 100km/h	0
ΔVma	<=3	0 – 100/km/h	0
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100/km/h	0
ΔVla	<=3	0 – 100/km/h	0
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0

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Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Enable*>: Enable or disable this function.
  - 0: Disable this function
  - 1: Enable this function
- <*High Speed*>, <*Medium Speed*>: If the last known speed of the device read from GPS is greater or equal to <*High Speed*>, the vehicle that the device is attached to is considered to be high speed. If the last known speed is less than <*High Speed*> while greater or equal to <*Medium Speed*>, the vehicle is considered to be medium speed. If the last known speed is less than <*Medium Speed*>, the vehicle is considered to be low speed.
- <Δ*Vhb*>: The threshold for harsh braking in high speed level. If within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to this value, a harsh braking is detected in high speed level. If set to 0, do not monitor harsh braking behavior in high speed level.
- <Δ*Vha*>: The threshold for harsh acceleration in high speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected in high speed level. If set to 0, do not monitor harsh acceleration behavior in high speed level.
- <Δ*Vmb*>: The threshold for harsh braking in medium speed level. If within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to this value, a harsh braking is detected in medium speed level. If set to 0, do not monitor harsh braking behavior in medium speed level.
- <Δ*Vma*>: The threshold for harsh acceleration in medium speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected in medium speed level. If set to 0, do not monitor harsh acceleration behavior in medium speed level.
- <Δ*Vlb*>: The threshold for harsh braking in low speed level. If within 5 seconds, the current speed is less than the last known speed and the change of the speed is greater than or equal to this value, a harsh braking is detected in low speed level. If set to 0, do not monitor harsh braking behavior in low speed level.
- <Δ*Vla*>: The threshold for harsh acceleration in low speed level. If within 5 seconds, the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value, a harsh acceleration is detected in low speed level. If set to 0, do not monitor harsh acceleration behavior in low speed level.

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The acknowledgment message of **AT+GTHBM** command:

- **+ACK:GTHBM,**

Example: **+ACK:GTHBM,080100,135790246811220,,000F,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.17. Time Adjustment

The command **AT+GTTMA** is used to adjust the local time of the device remotely. Upon this command, the device will set the time zone and daylight saving accordingly. Then it will use the given UTC time to adjust the local time based on the time zone and daylight saving setting. This command will also trigger the device to start GPS. After a successful GPS fix, the device will update the local time with the GPS UTC time again.

➢ **AT+GTTMA=**

Example: **AT+GTTMA=gmt100,-,3,30,0,20090917203500,,,,,0010$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Sign	1	+|–	+
Hour Offset	<=2	0 – 23	0
Minute Offset	<=2	0 – 59	0
Daylight Saving	1	0|1	0
UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Sign*>: Indicate the positive or negative of the local time offset to UTC
✧ <*Hour Offset*>: UTC offset in hours
✧ <*Minute Offset*>: UTC offset in minutes
✧ <*Daylight Saving*>: Enable/disable daylight saving time.
- 0: Disable daylight saving
- 1: Enable daylight saving

✧ <*UTC time*>: UTC time to adjust the local time..

The acknowledgment message of **AT+GTTMA** command:

➢ **+ACK:GTTMA,**

Example:

+ACK:GTTMA,080100,135790246811220,,00010,20090214093254,11F0$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{‘A’ – ‘Z’,’0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.18. Outside Working Hours

To protect the privacy of the driver when they are off duty, the device could be configured to report empty location information during the outside working hours. The command **AT+GTOWH** is used to define the working hours and the working mode to protect the privacy. When this function is enabled, the device will report empty latitude, empty longitude, empty LAC and empty Cell ID in all the report messages except for **+RESP:GTSOS** and **+RESP:GTSOA**.

➢ **AT+GTOWH=**

Example: **AT+GTOWH=gmt100,1,1F,0900,1200,1300,1730,,,,1,1,0,0,,,,,0011$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Mode	1	0 – 1	0
Day of Work	<=2	0 – 7F	1F
Working Hours Start1	4	HHMM	0900
Working Hours End1	4	HHMM	1200
Working Hours Start2	4	HHMM	1300
Working Hours End2	4	HHMM	1800
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0|1	0
Duration	<=3	0 – 255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: Working mode.

- 0: Disable this function.

- 1: Automatic mode. Under this mode, the device will ignore the status of the digital input. It will automatically check the current time against the working hours arrange. If outside the working hours, hide the location information. Otherwise report normally.

✧ <*Day of Work*>: Specify the working days in a week in a bitwise manner.

- Bit 0 for Monday
- Bit 1 for Tuesday
- Bit 2 for Wednesday
- Bit 3 for Thursday
- Bit 4 for Friday
- Bit 5 for Saturday
- Bit 6 for Sunday

For each bit, 0 means off day, 1 means working day.

✧ <*Working Hours Start1*>, <*Working Hours End1*>: The first period of the working hours in a day.

✧ <*Working Hours Start2*>, <*Working Hours End2*>: The second period of the working hours in a day.

The acknowledgment message of **AT+GTOWH** command:

➢ **+ACK:GTOWH,**

Example: **+ACK:GTOWH,080100,135790246811220,,0011,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.2.19. Protocol Watchdog

The **AT+GTDOG** command is used to reboot the device in a time based manner or upon ignition. This helps the device avoid working in an exceptional status for a long time. Besides these two automatically reboot method, the device also supports to use the digital input to trigger the reboot manually.

➢ **AT+GTDOG=**

Example: **AT+GTDOG=gmt100,1,,1,0130,,1,1,,,,,0012$** **AT+GTDOG=gmt100,2,30,,,,1,1,,,,,0012$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Mode	1	0 – 2	0
Ignition Frequency	<=3	10 – 120 min	60
Interval	<=2	1 – 30 day	30
Time	4	HHMM	0200
Reserved	0		
Report Before Reboot	1	0|1	1
Input ID	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: Working mode.
- 0: Disable this function
- 1: Reboot periodically according to the <*Interval*> and <*Time*> setting.
- 2: Reboot when ignition on.

✧ <*Ignition Frequency*>: When the working mode is 2, if the time interval between two adjacent ignitions is greater than the specified value, the device will automatically reboot upon ignition on.

✧ <*Interval*>: The interval to reboot the device in day.

✧ <*Time*>: At what time to perform the reboot operation when <*Interval*> is met.

✧ <*Report Before Reboot*>: Whether to report the **+RESP:GTDOG** message before reboot. 0

means no report, 1 to report. If this is enabled, the device will make a real-time location before sending the message in order to send it with the current location information.

✧ <*Input ID*>: ID of the digital input port which is used to trigger the manually reboot. 0 means do not use manual reboot. Only port 1 is supported.

The acknowledgment message of **AT+GTDOG** command:

➢ **+ACK:GTDOG,**

Example: **+ACK:GTDOG,080100,135790246811220,,0012,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.20. Auto-unlock PIN

The command **AT+GTPIN** is used to configure the auto-unlock PIN function of the device. Some operators offer SIM card with PIN code protection by default. To make the device work with the PIN-protected SIM card, use this command to let the device auto-unlock the SIM PIN with the pre-set PIN code.

➢ **AT+GTPIN=**

Example: **AT+GTPIN=gmt100,1,0000,,,,,,0013$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Enable Auto-unlock PIN	1	0|1	1
PIN	4 – 8	'0' – '9'	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Enable Auto-unlock PIN*>: 1 to enable the auto-unlock PIN function, 0 to disable.

✧ <*PIN*>: Code used to unlock the SIM PIN.

The acknowledgment message of **AT+GTPIN** command:

➢ **+ACK:GTPIN,**

Example: **+ACK:GTPIN,080100,135790246811220,,0013,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{‘A’ – ‘Z’,’0’ – ‘9’}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.21. Real Time Operation

The command **AT+GTRTO** is used to retrieve information from the terminal or control the terminal to execute certain actions.

➢ **AT+GTRTO=**

Example: **AT+GTRTO=gmt100,A,,,,,,0014$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Sub Command	1	0 – C	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Sub Command*>: Valid value is 0−9, A, B, C.

- 0: ***GPS***. Get the GPS related information via message **+RESP:GTGPS**.
- 1: ***RTL***. Request the terminal to report its current position immediately via message **+RESP:GTRTL**.
- 2: ***READ***. Get the current configuration of the terminal via message **+RESP:GTALL**.
- 3: ***REBOOT***. Reboot the terminal.
- 4: ***RESET***. Reset all parameters to factory setting. Parameters configured by **AT+GTBSI** and **AT+GTSRI** will not be reset.
- 5: ***PWROFF***. Power off the device.
- 6: ***CID***. Get the ICCID of the SIM card which is being used by the terminal via message **+RESP:GTCID**.
- 7: ***CSQ***. Get the current GSM signal level of the terminal via message **+RESP:GTCSQ**.
- 8: ***VER***. Get the version information of the device via message **+RESP:GTVER**.
- 9: ***BAT***. Get the battery level and adapter status of the terminal via message **+RESP:GTBAT**.
- A: ***IOS***. Get status of all the IO ports via message **+RESP:GTIOS**.
- B: ***TMZ***. Get the time zone settings via message **+RESP:GTTMZ**.
- C: ***GIR***. Get cell information via message **+RESP:GTGSM**.

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The acknowledgment message of **AT+GTRTO** command:

➢ **+ACK:GTRTO,**

Example: **+ACK:GTRTO,080100,135790246811220,,IOS,0014,20090214093254,11F1$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Sub Command	<=6	Sub command string	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Sub Command*>: A string to indicate the sub command of **AT+GTRTO**.

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3.2.22. Ignition Time Counter

The command **AT+GTHMC** is used to measure time of use with each actuation of the ignition on. To use this command, the ignition signal must be connected to the device. When the device sends **+RESP:GTFRI** and **+RESP:GTIGN** and **+RESP:GTIGF**, <*Ignition Time Count*> will be sent in these reports.

➢ **AT+GTHMC=**

Example: **AT+GTHMC=gmt100,1,12345:12:34,,,,,,,,0015$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Ignition Time Counter Enable	1	0|1	0
Initial Ignition Time Count	11	00000:00:00-99999:00:00	00000:00:00
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Ignition Time Counter Enable*>: Enable or disable ignition time counter function. If ignition time counter function is enabled, ignition time count will be increased when the device is in ignition.

- 0: Disable ignition time counter function
- 1: Enable ignition time counter function

✧ <*Initial Ignition Time Count*>: Initial ignition time count. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00– 99999:00:00. When engine is on at the first time, <*Ignition Time Count*> which report in **+RESP:GTFRI /+RESP:GTIGN/+RESP:GTIGF** will be increased based on this value.

The acknowledgment message of **AT+GTHMC** command:

- **+ACK:GTHMC,**

Example: **+ACK:GTHMC,080100,135790246811220,,0015,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.2.23. Jamming Detection

The command **AT+GTJDC** is used to configure the parameter for jamming detection. When the detection condition is matched, the device will report **+RESP:GTJDR** event message to the backend server.

➢ **AT+GTJDC=**

Example: **AT+GTJDC=gmt100,1,10,40,,,,,1,1,15,5,,0016$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	gmt100
Mode	1	0|1	0
Signal Threshold	<=3	0 – 255	10
C1 Threshold	<=3	0 – 255	40
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	0
Output Status	1	0|1	
Duration	<=3	0～255(×100ms)	0
Toggle Times	<=3	0 – 255	0
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Mode*>: Working mode.
- 0: Disable this function.
- 1: Enable this function.

✧ <*Signal Threshold*>, <*C1 Threshold*>: The built-in jamming detection algorithm uses these two parameters to judge whether the device is currently being jammed. The smaller the parameter, the more sensitive.

The acknowledgment message of **AT+GTJDC** command:

➢ **+ACK:GTJDC,**

Example: **+ACK:GTJDC,080100,135790246811220,,0016,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

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3.3. Report

This section defines the formats of the report messages. Due to the max length of SMS message (160 bytes), it is recommended to carefully set the <*Report Composition Mask*> in **AT+GTCFG** to limit the length of the report which contains GPS position information if you choose SMS as the transmit method. Otherwise the report will be truncated to fit the length of SMS message.

3.3.1. Position Related Report

- **+RESP:GTTOW,**

If the tow alarm is enabled by the command **AT+GTTOW**, the device will send the message **+RESP:GTTOW** to the backend server when the motion sensor detects tow.

- **+RESP:GTDIS,**

If the status of digital inputs are detected being changed, the device will send the message **+RESP:GTDIS** to the backend server.

- **+RESP:GTIOB,**

If the IO combination is set and the corresponding condition appears, the device will report the message **+RESP:GTIOB** to the backend server.

- **+RESP:GTGEO,**

If Geo-Fence is configured and enabled, the device will send the message **+RESP:GTGEO** to the backend server according to settings when the device enters or exits the Geo-Fence.

- **+RESP:GTSPD,**

If the speed alarm is enabled, the device will send the message **+RESP:GTSPD** to the backend server when the speed of the device is detected into the alarm range,.

- **+RESP:GTSOS,**

If the SOS mode is set to 1, the device will send the message **+RESP:GTSOS** to the backend server when the corresponding digital input port triggers SOS.

- **+RESP:GTRTL,**

After the device receives the command **AT+GTRTO**, it will start GPS to get the current position and then send the message **+RESP:GTRTL** to the backend server.

- **+RESP:GTDOG,**

The protocol watchdog reboot message.

- **+RESP:GTIGL,**

The protocol ignition on location message.

- **+RESP:GTHBM,**

If harsh behavior is detected, this message will be sent to the backend server.

All of the above report messages have the same format as shown below.

Example:

+RESP:GTTOW,080100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTDIS,080100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTIOB,060100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTGEO,080100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTSPD,080100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTSOS,080100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTRTL,080100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTDOG,080100,135790246811220,,,01,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTDOG,080100,135790246811220,,,13,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTIGL,080100,135790246811220,,,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTHBM,080100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTHBM,080100,135790246811220,,,11,1,1,24.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF,	

		X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved			
Report ID/Report Type	2	X(0-4)X(0-3)	
Number	1	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Report ID/Report Type*>: The report ID and the type of the report type in hex format. 4 high bits mean report ID and 4 low bits means report type.

Report ID has different meanings in different messages as below.

- The ID of digital input port which triggers the report message **+RESP:GTDIS** and **+RESP:GTSOS**. The value is 1.
- The ID of the bound IO which triggers the report message **+RESP:GTIOB**. The range is 0 – 3.
- The ID of Geo-Fence in the report message **+RESP:GTGEO**. The range is 0 – 4.
- The ID of the digital input port which triggers the reboot message **+RESP:GTDOG**. The valid value is 1 .
- The speed level of which the harsh behavior is detected in message **+RESP:GTHBM**. 3

is high speed, 2 is medium speed and 1 is low speed.

For the rest of the messages, it will always be 0.

Report type has different meanings in different messages as below.

- In the **+RESP:GTDIS** report message generated by the digital input
  0: The current logical status of the input port is disable status.
  1: The current logical status of the input is enable status.
- In the **+RESP:GTIOB** report message generated by bound IO
  0: The current logical status of the bound IO does not meet the alarm condition.
  1: The current logical status of the bound IO meets the alarm condition.
- In Geo-Fence report message **+RESP:GTGEO**
  0: Exit from the Geo-Fence.
  1: Enter the Geo-Fence.
- In the message of speed alarm **+RESP:GTSPD**
  0: Outside of the predefined speed range.
  1: Inside of the predefined speed range.
- In the message of protocol watch dog reboot message **+RESP:GTDOG**
  1: Reboot message for time based working mode
  2: Reboot message for ignition on working mode
  3: Reboot message for input triggered reboot
- In the message of harsh behavior monitoring message **+RESP:GTHBM**
  0: Harsh braking behavior
  1: Harsh acceleration behavior

For the rest of the messages, it will always be 0.

✧ <*Number*>: The number of the GPS position included in the report message. Generally, it equals to 1.

✧ <*GPS Accuracy*>: The HDOP defined in NMEA0183 (The National Marine Electronics Association (NMEA) is a non-profit association of manufacturers, distributors, dealers, educational institutions, and others interested in peripheral marine electronics occupations. The NMEA 0183 standard defines an electrical interface and data protocol for communications between marine instrumentation.). The range of value is 0 – 50. Here 0 means no GPS fix.

✧ <*Speed*>: The current speed. Unit: km/h

✧ <*Azimuth*>: The azimuth of the GPS fixing.

✧ <*Altitude*>: The height above the sea level.

✧ <*Longitude*>: The longitude of the current position.

✧ <*Latitude*>: The latitude of the current position.

✧ <*GPS UTC Time*>: The UTC time from the GPS chip.

✧ <*MCC*>: Mobile country code. It is 3 digits in length and ranges from 000–999.

✧ <*MNC*>: Mobile network code. It is 3 digits in length and ranges from 000–999.

✧ <*LAC*>: Location area code in hex format.

✧ <*Cell ID*>: Cell ID in hex format.

✧ <*Mileage*>: The current total mileage.

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➢ **+RESP:GTFRI,**

If fixed report is enabled, the device will send the message **+RESP:GTFRI** to the backend server according to the working mode.

Example:
+RESP:GTFRI,080100,135790246811220,,,10,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,12345:12:34,,80,,,,,,20090214093254,11F0$

+RESP:GTFRI,080100,135790246811220,,,10,2,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,0,4.3,92,70.0,121.354335,31.222073,20090101000000,0460,0000,18d8,6141,00,2000.0,12345:12:34,,80,,,,,,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
External Power Supply	<=5	0 – 28000 mV	
Report ID/Report Type	2	X(1-4)X(0-1)	
Number	<=2	0 – 15	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Ignition Time Count	11	HHHHH:MM:SS	
Analog Input 1	<=4	250～28000 mV	

Reserved			
Backup Battery Percentage	<=3	0 – 100	
Reserved			
Reserved			
Reserved			
Reserved			
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*External Power Supply*>: The voltage of the external power supply. If using command **AT+GTEPS** to set the device report the external power supply voltage periodically with fixed report, the device will send the current voltage along with **+RESP:GTFRI** message to the backend server. If not set, this field will be empty.
- <*Report ID/Report Type*>: Indicate the working mode of the fixed report and the type of the message.

  Report ID has four meanings as below.
  - 1: fixed timing report.
  - 2: fixed distance report.
  - 3: fixed mileage report.
  - 4: fixed timing and mileage report.

  Report type has two meanings as below.
  - 0: the normal fixed report.
  - 1: corner report which indicates that the device just turns around a corner.
- <*Number*>: The number of the GPS position included in the report message. In the message **+RESP:GTFRI**, it probably includes one or several GPS position according to the setting of <*Send Interval*> and <*Check Interval*>. If multi-position in one **+RESP:GTFRI** message, the green part repeats.
- <*Ignition Time Count*>: If ignition time counter function is enabled by the command **AT+GTHMC**, total ignition time counted when engine is on will be reported in this field. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00– 99999:00:00. If the function is disabled, this field will be reserved.
- <*Analog1 Input 1*>: The voltage of the analog input 1. If using command **AT+GTAIS** to set the device report the analog input 1 periodically with fixed report, the device will send the current voltage of the analog input 1 along with **+RESP:GTFRI** message to the backend server. If not set, this field will be empty.
- <*Backup Battery Percentage*>: The current volume of the backup battery in percentage.

➢ **+RESP:GTEPS,**

If the external power supply monitoring is enabled by the command **AT+GTEPS,** the device will

send the message **+RESP:GTEPS** to the backend server when the voltage of the external power supply enters the alarm range.

- **+RESP:GTAIS,**

If the analog input alarm is enabled by the command **AT+GTAIS,** the device will send the message **+RESP:GTAIS** to the backend server when analog input voltage enters the alarm range.

Example:
+RESP:GTEPS,080100,135790246811220,,13500,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

+RESP:GTAIS,080100,135790246811220,,19800,11,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Analog Input VCC	<=5	0 – 28000 mV	
Report ID/Report Type	2	X(0-1)X(0-1)	
Number	<=2	0 – 1	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- < *Analog Input VCC*>: The value of the analog input voltage. When the voltage of the analog input meets the alarm condition as set by command **AT+GTEPS** or **AT+GTAIS**, the device will send the current analog input voltage with **+RESP:GTEPS** or **+RESP:GTAIS** message to the backend server.
- <*Report ID/Report Type*>: The report ID and the type of the report type in hex format. 4 high bits mean report ID and 4 low bits means report type.

  Report ID has different meanings in these two messages.
  - The ID of analog input port which triggers report message +RESP:GTEPS. The value is 0.
  - The ID of analog input port which triggers report message +RESP:GTAIS. The range is 1.

  Report type has two meanings as below.
  - 0: Outside of the predefined range.
  - 1: Inside of the predefined range.
- <*Number*>: The number of the GPS position included in the report message. Generally, it equals to 1.

➢ **+RESP:GTLBC,**

If the parameter <*Location By Call*> is set to 1 by the command **AT+GTCFG**, the device will get and send the current position to the backend server by the message **+RESP:GTLBC** when there is an incoming call.

Example: **+RESP:GTLBC,080100,135790246811220,,+8613800000000,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Call Number	<=20	phone number	
GPS Accuracy	<=2	0|1 – 50	
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	

Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Call Number*>: The phone number of the incoming call which triggers the report message.

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3.3.2. Device Information Report

If the device information report function is enabled by the command **AT+GTCFG**, the device will send the device information by the message **+RESP:GTINF** to the backend server periodically.

- **+RESP:GTINF,**

Example: **+RESP:GTINF,080100,135790246811220,,16,898600810906F8048812,16,0,1,11870,,4.1,0,0,0,,20090214013254,,12340,,00,00,+0800,0,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
State	2	11|12|21|22|41|42|1A|16	
ICCID	20		
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
External Power Supply	1	0|1	
External Power VCC	<=5	0 – 28000mV	
Reserved	0		
Backup Battery VCC	<=4	0.0 – 4.5 V	
Charging	1	0|1	
LED On	1	0|1	
GPS On Need	1	0|1	
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Reserved	0		
Analog Input VCC	<=5	0 – 28000mV	
Reserved	0		
Digital Input	2	00 – 03	
Digital Output	2	00 – 03	
Time Zone Offset	5	±HHMM	

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Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*State*>: The current motion state of the device.
  - 16 (**Tow**): The device attached vehicle is ignition off and it is towed.
  - 1A (**Fake Tow**): The device attached vehicle is ignition off and it might be towed.
  - 11 (**Ignition Off Rest**): The device attached vehicle is ignition off and it is motionless.
  - 12 (**Ignition Off Motion**): The device attached vehicle is ignition off and it is moving before it is treated as being towed.
  - 21 (**Ignition On Rest**): The device attached vehicle is ignition on and it is motion less
  - 22 (**Ignition On Motion**): The device attached vehicle is ignition on and it is moving
  - 41 (**Sensor Rest**): The device attached vehicle is motionless without ignition signal detected
  - 42 (**Sensor Motion**): The device attached vehicle is moving without ignition signal detected
- <*ICCID*>: The ICCID of the SIM card.
- <*CSQ RSSI*>: The signal strength level.

CSQ RSSI	Signal Strength (dBm)
0	<-133
1	-111
2 – 30	-109 – -53
31	>-51
99	Unknown

- <*CSQ BER*>: The quality of the GSM signal. The range is 0-7, 99 for unknown.
- <*External Power Supply*>: Whether the external power supply is connected.
  - 0: Not connected
  - 1: Connected
- <*External Power Supply VCC*>: The voltage of the external power supply.
- <*Backup Battery VCC*>: The voltage of the backup battery. The value of this field is only valid when the external power is not connected.
- <*Charging*>: Whether the backup battery is charging when the main power supply is connected.
  - 0: Not charging
  - 1: Charging
- <*Last Fix UTC Time*>: The UTC time of the latest successful GPS fixing.
- <*Analog Input VCC*>: The voltage of the analog input.
- <*Digital Input*>: A bitwise hex integer to represents the logical status of the digital input. From the lowest bit to the highest bit, each bit represents ignition detection and the digital input 1 respectively. For each bit, 0 means disable status, 1 means enable status.
- <*Digital Output*>: A bitwise hex integer to represents the logical status of the digital output.

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From the lowest bit to the highest bit, each bit represents the digital output 1 and CUT relay output respectively. For each bit, 0 means disable status, 1 means enable status.

- ✧ <*Time Zone Offset*>: The time offset of the local time zone to the UTC time.
- ✧ <*Daylight Saving*>: The current setting of the daylight saving.
  - 0: Daylight saving is disabled
  - 1: Daylight saving is enabled

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3.3.3. Report of Real Time Querying

3.3.3.1. +RESP:GTGPS

After the device receives the command **AT+GTRTO** to read the GPS information, it will send the GPS information to the backend server by the message **+RESP:GTGPS**.

➢ **+RESP:GTGPS,**

Example: **+RESP:GTGPS,080100,135790246811220,,0,,,0000,,,20090214013254,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
GPS On Need	1	0|1	
Reserved	0		
Reserved	0		
Report Composition Mask	4	0000 – FFFF	
Reserved	0		
Reserved	0		
Last Fix UTC Time	14	YYYYMMDDHHMMSS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Report Composition Mask>*: Refer to *<Report Composition Mask>* of **AT+GTCFG** command

3.3.3.2. +RESP:GTALL

After the device receives the command **AT+GTRTO** to read all the configurations, it will send all configurations to the backend server by the message **+RESP:GTALL**. This message only sends via GPRS even if the report mode is force on SMS.

➢ **+RESP:GTALL,**

Example:
+RESP:GTALL,080100,135790246811220,,BSI,cmnet,,,,,,SRI,3,1,1,116.226.44.17,7011,116.226.45.229,7012,+8613812341234,15,1,,,,CFG,gmt100,gmt100,1,123.4,0,0,0000,1,,02FF,,0,1,300,0,,0,0,,,TOW,1,10,0,120,1,0,5,10,200,10,4,,,,,,,,EPS,2,250,11870,3,2,1,1,0,0,1,,,,DIS,0,1,,,1,1,4,,2,1,,,,,,TMZ,–0330,0,,,,,FRI,1,1,,1,1000,2300,180,30,1000,1000,,0,600,,,GEO,0,3,121.412248,31.187891,1000,600,1,1,0,0,,,,,1,0,,,0,0,0,0,0,0,,,,,2,0,,,0,0,0,0,0,0,,,,,3,0,,,0,0,0,0,0,0,,,,,4,0,,,0,0,0,0,0,0,,,,,SPD,1,80,120,60,300,1,1,0,0,,,,,,,,,,SOS,1,1,+8613812341234,1,1,0,0,,,,,PIN,1,0000,0,,,,,OWH,1,1F,0900,1200,1300,1730,,,,1,1,0,0,,,,,DOG,1,60,1,0130,,1,1,,,,,IDL,1,2,1,,,,,1,1,0,0,,,,,HMC,1,12345:12:34,,,,,,,,,HBM,1,,,100,21,6,,60,21,6,,,21,15,,1,1,8,3,,,,,JDC,1,10,40,,,,,1,1,15,5,,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
BSI	3	BSI	BSI
APN	<=40		
APN User Name	<=30		
APN Password	<=30		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SRI	3	SRI	SRI
Report Mode	1	0 – 6	
Reserved	1	0|1	
Buffer Report	1	0 – 2	
Main Server IP / Domain Name	<=60		
Main Server Port	<=5	0 – 65535	
Backup Server IP	<=15		
Backup Server Port	<=5	0 – 65535	
SMS Gateway	<=20		
Heartbeat Interval	<=3	0|5 – 360min	

SACK Enable	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
CFG	3	CFG	CFG
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
ODO Enable	1	0|1	
ODO Initial Mileage	<=9	0.0 – 4294967.0Km	
GPS On Need	1	0|1	
GSM report	1	0 – 3	
Report Composition Mask	<=4	0000 – FFFF	
Power Saving Mode	1	0 –2	
Reserved	0		
Event Mask	<=4	00000000 – FFFFFFFF	
Reserved	0		
LED On	1	0|1	
Info Report Enable	1	0|1	
Info Report Interval	<=5	30 – 86400sec	
Location By Call	1	0 – 2	
Reserved	0		
Power Mode	1	0 – 2	
Agps Mode	1	0|1	
Reserved	0		
Reserved	0		
TOW	3	TOW	TOW
Tow Enable	1	0|1	
Engine Off to Tow	<=2	0 – 900 sec	
Fake Tow Delay	<=2	0 – 600 sec	

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Tow Interval	<=5	0 – 86400 sec	
Tow Output ID	1	0 – 2	
Tow Output Status	1	0|1	
Tow Output Duration	<=3	0 – 255(×100ms)	
Tow Output Toggle Times	<=3	0 – 255	
Rest Duration	<=3	1 – 255(×15sec)	
Motion Duration	<=2	1 – 99(×100ms)	
Motion Threshold	1	2 – 9	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
EPS	3	EPS	EPS
Mode	1	0 – 2	
Min Threshold	<=5	250 – 28000 mV	
Max Threshold	<=5	250 – 28000 mV	
Sample Period	<=2	0|1 – 12(×2s)	
Debounce Time	1	0 – 5(×1s)	
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Sync with FRI	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		

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DIS	3	DIS	DIS
Ignition Detection	1	0	0
Sample Period	<=2	0|1 – 12(×2s)	
Reserved	0		
Reserved	0		
Input ID 1	1	1	1
Enable	1	0|1	
Debounce Time	<=2	0 – 20(×10ms)	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
TMZ	3	TMZ	TMZ
Time Zone	5	–|+HHMM	
Daylight Saving	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
FRI	3	FRI	FRI
Mode	1	0 – 4	
Discard No Fix	2	0|1	
Reserved	0		
Period Enable	1	0|1	
Begin Time	4	HHMM	
End Time	4	HHMM	
Check Interval	<=5	0|30 – 86400sec	
Send Interval	<=5	0|5 – 86400sec	

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Distance	<=5	300 – 65535m	
Mileage	<=5	300 – 65535m	
Reserved	0		
Corner Report	<=3	0 | 40 – 100	
IGF Report Interval	<=5	300-86400sec	
Reserved	0		
Reserved	0		
GEO	3	GEO	GEO
GEO ID0	1	0	0
Mode	1	0 – 3	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID1	1	1	1
Mode	1	0 – 3	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Output ID	1	0 – 2	
Output Status	1	0|1	

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Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID2	1	2	2
Mode	1	0 – 3	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID3	1	3	3
Mode	1	0 – 3	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	

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Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
GEO ID4	1	4	4
Mode	1	0 – 3	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
Radius	<=7	50 – 6000000m	
Check Interval	<=5	0 | 5 – 86400sec	
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SPD	3	SPD	SPD
Mode	1	0 – 2	
Min Speed	<=3	0 – 400km/h	
Max Speed	<=3	0 – 400km/h	
Validity	<=4	15 – 3600sec	
Send Interval	<=4	30 – 3600sec	
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		

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Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
SOS	3	SOS	SOS
Mode	1	0 – 2	
Digital Input ID	1	0|1	
SOS Number	<=20		
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
PIN	3	PIN	PIN
Enable Auto-unlock PIN	1	0|1	
PIN	1	'0' – '9'	
SIM PIN Lock	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
OWH	3	OWH	OWH

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Mode	1	0 – 1	
Day of Work	<=2	0 – 7F	
Working Hours Start1	4	HHMM	
Working Hours End1	4	HHMM	
Working Hours Start2	4	HHMM	
Working Hours End2	4	HHMM	
Reserved	0		
Reserved	0		
Reserved	0		
Digital Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
DOG	3	DOG	DOG
Mode	1	0 – 2	
Ignition Frequency	<=3	10 – 120min	
Interval	<=2	1 – 30	
Time	4	HHMM	
Reserved	0		
Report Before Reboot	1	0|1	
Input ID	1	0|1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
IDL	3	IDL	IDL

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Mode	1	0|1	
Time to Stationary	1	1 – 5 min	
Time to Movement	1	1 – 5 min	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HMC	3	HMC	HMC
Ignition Time Counter Enable	1	0|1	
Initial Ignition Time Count	11	00000:00:00-99999:00:00	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
HBM	3	HBM	HBM
HBM Enable	1	0|1	
Reserved	0		

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Reserved	0		
High Speed	<=3	100 – 400km/h	
ΔVhb	<=3	0 – 100km/h	
ΔVha	<=3	0 – 100km/h	
Reserved	0		
Medium Speed	<=3	100 – 400km/h	
ΔVmb	<=3	0 – 100km/h	
ΔVma	<=3	0 – 100km/h	
Reserved	0		
Reserved	0		
ΔVlb	<=3	0 – 100km/h	
ΔVla	<=3	0 – 100km/h	
Reserved	0		
Output ID	1	0 – 2	
Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
JDC	3	JDC	JDC
Mode	1	0|1	0
Signal Threshold	<=3	0 – 255	10
C1 Threshold	<=3	0 – 255	40
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Output ID	1	0 – 2	

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Output Status	1	0|1	
Duration	<=3	0 – 255(×100ms)	
Toggle Times	<=3	0 – 255	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.3. +RESP:GTCID

After the device receives the command **AT+GTRTO** to read the ICCID of the SIM card, it will send the ICCID to the backend server by the message **+RESP:GTCID**.

- **+RESP:GTCID,**

Example: **+RESP:GTCID,080100,135790246811220,,898600810906F8048812,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
ICCID	20		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.4. +RESP:GTCSQ

After the device receives the command **AT+GTRTO** to read the GSM signal level, it will send the GSM signal level to the backend server by the message **+RESP:GTCSQ**.

- **+RESP:GTCSQ,**

Example: **+RESP:GTCSQ,080100,135790246811220,,16,0,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF,	

		X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*CSQ RSSI*>: The signal strength level.

CSQ RSSI	Signal Strength (dBm)
0	<-133
1	-111
2 – 30	-109 – -53
31	>-51
99	Unknown

✧ <*CSQ BER*>: The quality of the GSM signal. The range is 0-7, 99 for unknown.

3.3.3.5. +RESP:GTVER

After the device receives the command **AT+GTRTO** to get the versions (including software version and hardware version), it will send the version information to the backend server by the message **+RESP:GTVER**.

➢ **+RESP:GTVER,**

Example: **+RESP:GTVER,080100,135790246811220,,GMT100,0100,0101,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Device Type	10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Software Version	4	0000 – FFFF	
Hardware Version	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- ✧ <*Device Type*>: The type of the device.
- ✧ <*Software Version*>: The software version. The first two characters represent the major version and the last two characters represent the minor version. For example: **010A** means the version **1.10**.
- ✧ <Hardware Version>: The hardware version. The first two characters represent the major version and the last two characters represent the minor version. For example: **010A** means the version **1.10**.

3.3.3.6. +RESP:GTBAT

After the device receives the command **AT+GTRTO** to read the power supply information, it will send the power supply information to the backend server by the message **+RESP:GTBAT**.

➢ **+RESP:GTBAT,**

Example: **+RESP:GTBAT,080100,135790246811220,,1,12000,,4.40,0,0,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
External Power Supply	1	0|1	
External Power VCC	<=5	0 – 28000mV	
Reserved	0		
Backup Battery VCC	<=4	0.0 – 4.5 V	
Charging	1	0|1	
LED On	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.7. +RESP:GTIOS

After the device receives the command **AT+GTRTO** to get all the IO ports status, it will send the status to the backend server by the message **+RESP:GTIOS**.

➢ **+RESP:GTIOS,**

Example: **+RESP:GTIOS,080100,135790246811220,,,12000,,00,00,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved	0		
Analog Input VCC1	<=4	0 – 32000 mV	
Reserved	0		
Digital Input	2	00 – 03	
Digital Output	2	00 – 03	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

3.3.3.8. +RESP:GTTMZ

After the device receives the command **AT+GTRTO** to get the time zone settings, it will send the time zone settings by the message **+RESP:GTTMZ** to the backend server.

➢ **+RESP:GTTMZ,**

Example: **+RESP:GTTMZ,080100,135790246811220,,+0800,0,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Time Zone Offset	5	±HHMM	
Daylight Saving	1	0|1	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	

Tail Character	1	$	$

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3.3.4. Event Report

The following event reports are triggered when certain events occur.
+RESP:GTPNA: Power on report
+RESP:GTPFA: Power off report
+RESP:GTMPN: The report for connecting main power supply
+RESP:GTMPF: The report for disconnecting main power supply
+RESP:GTBTC: Backup battery starts charging report
+RESP:GTSTC: Backup battery stop charging report.
+RESP:GTBPL: Backup battery low
+RESP:GTBPN: Backup battery is connected.
+RESP:GTBPF: Backup battery is removed.
+RESP:GTSOA: Shell is opened.
+RESP:GTSTT: Device motion state indication when the motion state is changed
+RESP:GTANT: External GPS antenna status indication when the state is changed
+RESP:GTPDP: GPRS connection establishment report
+RESP:GTIGN: ignition on report
+RESP:GTIGF: ignition off report
+RESP:GTIDN: Enter into idling status
+RESP:GTIDF: Leave idling status
+RESP:GTJDR: Jamming indication
+RESP:GTGSM: The report for the information of the service cell and the neighbor cells.

In **+RESP:GTMPN**, **+RESP:GTMPF**, **+RESP:GTBTC**, **+RESP:GTSTC**, **+RESP:GTBPL**, **+RESP:GTBPN**, **+RESP:GTBPF**, **+RESP:GTSOA**, **+RESP:GTSTT**, **+RESP:GTANT**, **+RESP:GTIGN**, **+RESP:GTIGF**, **+RESP:GTIDN**, **+RESP:GTIDF** and **+RESP:GTJDR** event reports, the last known GPS information and the current GSM network information are involved.

- **+RESP:GTPNA,**
- **+RESP:GTPFA,**
- **+RESP:GTPDP,**

Example:
+RESP:GTPNA,080100,135790246811220,,20090214093254,11F0$
+RESP:GTPFA,080100,135790246811220,,20090214093254,11F0$
+RESP:GTPDP,080100,135790246811220,,20090214093254,11F0$

Parameter	Length(byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Send Time	14	YYYYMMDDHHMMSS	

Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTMPN,**
- **+RESP:GTMPF,**
- **+RESP:GTBTC,**
- **+RESP:GTBPN,**
- **+RESP:GTBPF,**
- **+RESP:GTSOA,**
- **+RESP:GTJDR,**

Example:
+RESP:GTMPN,080100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTMPF,080100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTBTC,080100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTBPN,080100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTBPF,080100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTSOA,080100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$
+RESP:GTJDR,080100,135790246811220,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$

Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	

MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTSTC,**

Example: **+RESP:GTSTC,080100,135790246811220,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTBPL,**

Example: **+RESP:GTBPL,080100,135790246811220,,3.53,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Backup Battery VCC	<=4	0.0 – 4.5 V	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

➢ **+RESP:GTSTT,**

Example: **+RESP:GTSTT,080100,135790246811220,,16,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
State	2	11|12|21|22|41|42|16	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*State*>: The current movement state of the device.

- 16 (Tow): The device attached vehicle is ignition off and it is towed.
- 11 (Ignition Off Rest): The device attached vehicle is ignition off and it is motionless.
- 12 (Ignition Off Motion): The device attached vehicle is ignition off and it is moving before it is treated as being towed.
- 21 (Ignition On Rest): The device attached vehicle is ignition on and it is motion less
- 22 (Ignition On Motion): The device attached vehicle is ignition on and it is moving
- 41 (Sensor Rest): The device attached vehicle is motionless without ignition signal detected
- 42 (Sensor Motion): The device attached vehicle is moving without ignition signal detected

➢ **+RESP:GTANT,**

Example: **+RESP:GTANT,080100,135790246811220,,0,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
External GPS Antenna	1	0|1|2|3	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ < *External GPS Antenna*>: The current state of the external GPS antenna.

- 0: The external GPS antenna of the device is working.
- 1: The external GPS antenna of the device is detected in open circuit state.
- 2: The external GPS antenna of the device is detected in short circuit state.
- 3: The external GPS antenna of the device is in unknown state.

➢ **+RESP:GTIGN,**

Example: **+RESP:GTIGN,080100,135790246811220,,1200,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Duration of Ignition Off	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Ignition Time Count	11	HHHHH:MM:SS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Duration of Ignition Off*>: Duration since last time the ignition is off. If greater than 999999 seconds, report as 999999 seconds.
- <*Ignition time Count*>: If ignition time counter function is enabled by the command **AT+GTHMC**, total ignition time counted when engine is on will be reported in this field. If the function is disabled, this field will be reserved. It is formatted with 5 hour digits and 2 minute digits and 2 second digits and ranges from 00000:00:00– 99999:00:00.

➢ **+RESP:GTIGF,**

Example: **+RESP:GTIGF,080100,135790246811220,,1200,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Duration of Ignition On	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	
Mileage	<=9	0.0 – 4294967.0 km	
Ignition Time Count	2|11	00|HHHHH:MM:SS	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Duration of Ignition On*>: Duration since last time the ignition is on. If greater than 999999 seconds, report as 999999 seconds.

➢ **+RESP:GTIDN,**

Example:

+RESP:GTIDN,080100,135790246811220,,,,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Reserved	0		
Reserved	0		
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- **+RESP:GTIDF,**

Example: **+RESP:GTIDF,080100,135790246811220,,22,300,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,2000.0,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**

Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Motion State	2	11|12|16|22	
Duration of Idling Status	<=6	0 – 999999 sec	
GPS Accuracy	<=2	0	0, Last known
Speed	<=5	0.0 – 999.9 km /h	
Azimuth	<=3	0 – 359	
Altitude	<=8	(–)xxxxx.x m	
Longitude	<=11	(–)xxx.xxxxxx	
Latitude	<=10	(–)xx.xxxxxx	
GPS UTC Time	14	YYYYMMDDHHMMSS	
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4	XXXX	
Cell ID	4	XXXX	
Reserved	2	00	00
Mileage	<=9	0.0 – 4294967.0 km	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Motion State*>: The current motion state when the vehicle leaves idling status.

✧ <*Duration of Idling Status*>: The time that the vehicle has been in idling status. If greater than 999999 seconds, report as 999999 seconds.

+RESP:GTGSM

Example: **+RESP:GTGSM,080100,135790246811220,FRI,0460,0000,1878,0871,20,,0460,0000,1878,0152,16,,,,,,,,,,,,,,,,,,,,,,,,0460,0000,1878,0873,57,00,20090214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	

Unique ID	15	IMEI	
Fix Type	3	SOS|RTL|LBC|TOW|FRI|GIR	
MCC1	4	0XXX	
MNC1	4	0XXX	
LAC1	4		
Cell ID1	4		
RX Level1	2	0-63	
Reserved	0		
MCC2	4	0XXX	
MNC2	4	0XXX	
LAC2	4		
Cell ID2	4		
RX Level2	2	0-63	
Reserved	0		
MCC3	4	0XXX	
MNC3	4	0XXX	
LAC3	4		
Cell ID3	4		
RX Level3	2	0-63	
Reserved	0		
MCC4	4	0XXX	
MNC4	4	0XXX	
LAC4	4		
Cell ID4	4		
RX Level4	2	0-63	
Reserved	0		
MCC5	4	0XXX	
MNC5	4	0XXX	
LAC5	4		
Cell ID5	4		

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RX Level5	2	0-63	
Reserved	0		
MCC6	4	0XXX	
MNC6	4	0XXX	
LAC6	4		
Cell ID6	4		
RX Level6	2	0-63	
Reserved	0		
MCC	4	0XXX	
MNC	4	0XXX	
LAC	4		
Cell ID	4		
RX Level	2	0-63	
Reserved	2	00	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

- <*Fix Type*> : A string to indicate what kind of GPS fixing this cell information is for.
  "SOS" This cell information is for SOS requirement.
  "RTL" This cell information is for RTL requirement.
  "LBC" This cell information is for LBC requirement.
  "TOW" This cell information is for TOW requirement.
  "FRI" This cell information is for FRI requirement.
  "GIR" This cell information is for sub command "**C**" in **AT+GTRTO** command.
- <*MCC(i)*> : MCC of the neighbor cell *i* (*i* is the index of the neighbor cell).
- <*MNC(i)*> : MNC of the neighbor cell *i*.
- <*LAC(i)*> : LAC in hex format of the neighbor cell *i*.
- <*Cell ID(i)*> : Cell ID in hex format of the neighbor cell *i*.
- <*RX Level(i)*> : The signal strength of the neighbor cell *i*. This parameter is a 6-bit coded in 1 dB steps:
  0: -110 dBm
  1 to 62: -109 to -48 dBm
  63: -47 dBm
- <*MCC*>: MCC of the service cell.
- <*MNC*>: MNC of the service cell.
- <*LAC*>: LAC in hex format of the service cell.

- ✧ <*Cell ID*>: Cell ID in hex format of the service cell.
- ✧ <*RX Level*>: The signal strength of the service cell.

Note:

1. It probably includes only several neighbor cells' (even no neighbor cell) information. If some neighbor cell wasn't find, all the fields of the neighbor cell will be empty.
2. "ffff" in the field of <*LAC(i)*>, <*Cell ID(i)*> means the terminal doesn't know the value.
3. This message cannot be sent via SMS.

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3.3.5. Buffer Report

If the buffer report function is enabled by command **AT+GTSRI**, the terminal will save the report messages in a local buffer when the following occurs.

- ✧ GSM network is not available
- ✧ Failed to activate GPRS context for the TCP or UDP connection.
- ✧ Failed to establish the TCP connection with the backend server.

These messages will be sent to the backend server when connection to the server recovers again. The buffer reports are saved to the built-in non-volatile memory in case the device is reset. The terminal can buffer up to 3000 messages (160 bytes per message).

Detailed information about buffer report is listed below.

- ✧ Only **+RESP** messages are buffered except that **+RESP:GTALL** is not buffered
- ✧ In the buffer report, the original header string "**+RESP**" is replaced by "**+BUFF**" while keeps the other content untouched including the original sending time and count number.
- ✧ Buffered messages will be sent only via GPRS by TCP or UDP protocol. They cannot be sent via SMS. If the current report mode is forcing on SMS, the buffered messages will be sent via TCP short connection.
- ✧ The buffered messages will be sent after the other normal messages sending if <*Buffer Mode*> in **AT+GTSRI** is set to 1.
- ✧ The buffered messages will be sent before the other normal messages sending if <*Buffer Mode*> in **AT+GTSRI** is set to 2. The SOS message has the highest priority and is sent before the buffered messages.

Example:

The following is an example of the buffered message:

+BUFF:GTFRI,020100,135790246811220,,0,0,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,00,,20090214093254,11F0$

3.3.6. Report Google Maps hyperlink

According to the setting of the command **AT+GTSOS** and the configuration of location by call, the device can send a SMS with Google Maps hyperlink to a mobile phone.

If the <*Mode*> was set to 2 in the command **AT+GTSOS**, the terminal will send a SMS with Google Maps hyperlink to the direct phone numbers.

If <*Location By Call*> is set to 2, the terminal will send its current position to the incoming call via SMS with Google Maps hyperlink.

➢ **Google Maps hyperlink**

Example:
GMT100 SOS:
<http://maps.google.com/maps?q=31.222073,121.354335
F1 D2009/01/01T00:00:00>

GMT100 LBC:
<http://maps.google.com/maps?q=31.222073,121.354335
F1 D2009/01/01T00:00:00>

Parameter	Length(byte)	Range/Format	Default
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Report Type	3	SOS|LBC	
Google Maps Hyperlink Header	30	http://maps.google.com/maps?q=	http://maps.google.com/maps?q=
Latitude	<=10	(–)xx.xxxxxx	
Longitude	<=11	(–)xxx.xxxxxx	
GPS Fix	<=3	F0|F1 – F50	
GPS UTC Time	20	DYYYY/MM/DDTHH:MM:SS	

✧ <*Report Type*>: A string that includes GPS fix type ("**SOS**", "**LBC**").
✧ <*Google Maps hyperlink*>: A string of a google map hyperlink.
✧ <*GPS Fix*>: The accuracy of the location information. F0 means no GPS fix.

3.4. Heartbeat

Heartbeat is used to maintain the contact between the device and the backend server if communicating via GPRS. The heartbeat package is sent to the backend server at the interval defined by <*Heartbeat interval*> in **AT+GTSRI** command.

➢ **+ACK:GTHBD**

Example: **+ACK:GTHBD,080100,135790246811220,,20100214093254,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0' – '9' 'a' – 'z' 'A' – 'Z'	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Whenever the backend server receives a heartbeat package, it should reply an acknowledgement to the device.

➢ **+SACK:GTHBD**

Example: **+SACK:GTHBD,080100,11F0$** **+SACK:GTHBD,,11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Protocol Version*>: The device type and the protocol version that the backend server supported. This field is optional. The backend server could just send an empty field to decrease the length of the heartbeat data acknowledgement.

✧ <*Count Number*>: The backend server uses the <*Count Number*> extracted from the heartbeat package from the device as the <*Count Number*> in the server acknowledgement of the heartbeat.

3.5. Server Acknowledgement

If server acknowledgement is enabled by **AT+GTSRI** command, the backend server should reply to the device whenever it receives a message from the device.

➢ **+SACK:**

Example: **+SACK:11F0$**			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Count Number*>: The backend server uses the <*Count Number*> extracted from the received message as the <*Count Number*> in the server acknowledgement.

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